

4,301,222 (Emanuelson);

- (2) Claims 3-5, 10-11, 13-15 and 17-23 under 35 U.S.C. § 103(a) over Balko in view of De Haas or, alternatively over De Haas in view of Balko;
- (3) Claims 3-5, 10-11, 13-15 and 17-23 under 35 U.S.C. § 103(a) over Emanuelson in view of De Haas or, alternatively over De Haas in view of Emanuelson;
- (4) Claim 12 under 35 U.S.C. § 103(a) over De Haas in view of Balko or, alternatively Balko in view of De Haas as previously applied, or Emanuelson in view of De Haas or, alternatively De Haas in view of Emanuelson as previously applied, and further in view of U.S. Patent No. 5,738,574 (Tolles); and
- (5) Claim 16 under 35 U.S.C. § 103(a) over De Haas in view of Balko or, alternatively Balko in view of De Haas as previously applied, or Emanuelson in view of De Haas or, alternatively De Haas in view of Emanuelson as previously applied, and further in view of U.S. Patent No. 5,750,190 (Kondrats).

Claim 23 is the sole independent claim. Claim 23

claims a method for manufacturing flow field plates for use in fuel cells, electrolyzers and batteries which contain a fluid electrolyte comprising providing a plate material of electrically conductive material and impermeable to hydrogen and oxygen, positioning a particulate etchant-resistant patterned mask comprising a pattern design adjacent the plate material, sandblasting, bead blasting or grit blasting the particulate etchant-resistant patterned mask to provide a fluid flow pattern determined by the pattern design on the mask on the plate material. The fluid flow pattern is further claimed as distributing fuel and oxidant across the plate material.

Claim 22 claims a flow field plate formed by the method of claim 23. The Examiner has rejected claim 22 under 35 U.S.C. § 102(b) over De Haas or Balko or Emanuelson.

De Haas is directed to plates of electrically insulating material, wherein the electrically insulating material has a plurality of cavities and/or apertures arranged in a pattern. The Examiner specifically acknowledges on pages 4 and 6 of the official action that De Haas does not teach a plate comprising an electrically conductive material. Rather, De Haas teaches plates made of electrically insulating material. As such, De Haas does not

teach or suggest a plate material of electrically conductive material as claimed.

Additionally, De Haas teaches insulating plates which are used as control plates, spacer plates, or electron transport duct plates. (See column 3, lines 20-21.) The flow field plates of the claimed invention are not configured to provide ducts or channels for electrons to move in, but rather to provide ducts enabling fuel and oxidant to be distributed across the plate material. Accordingly, De Haas does not teach or suggest a fluid flow pattern that distributes fuel and oxidant across the plate material as claimed.

Additionally, De Haas does not teach or suggest that the plate material is impermeable to hydrogen and oxygen as the claimed plate material.

As such, De Haas does not teach or suggest each and every element of the claimed invention as set forth above. Withdrawal of the § 102 rejection based on De Haas is respectfully requested.

Balko is directed to plates prepared by a pressure molding. The Examiner specifically acknowledges on page 4 of the official action that Balko does not teach sandblasting, bead blasting or grit blasting a particulate etchant-resistant patterned mask to provide a fluid flow

pattern. As such, Balko does not teach or suggest blasting methods as claimed.

Additionally, Balko does not teach or suggest a plate material impermeable to hydrogen and oxygen as claimed. Also, Balko does not teach or suggest a fluid flow pattern to distribute fuel and oxidant across the plate material as claimed.

As such, Balko does not teach or suggest each and every element of the claimed invention. Withdrawal of the § 102 rejection based on Balko is respectfully requested.

Emanuelson is directed to a thin electrochemical cell separator plate which is made by molding and then graphitizing a mixture of high purity graphite powder and carbonizable thermosetting phenolic resin. The Examiner specifically acknowledges on page 5 of the official action that Emanuelson does not teach sandblasting, bead blasting or grit blasting a particulate etchant-resistant patterned mask to provide a fluid flow pattern. As such, Emanuelson does not teach or suggest blasting methods as claimed.

Additionally, Emanuelson does not teach or suggest a plate material impermeable to hydrogen and oxygen as claimed. (See column 5, lines 6-8). Also, Emanuelson does not teach or suggest a plate material of electrically conductive material. Rather, Emanuelson teaches plates

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having electrical thru-plane resistivity and in-plane resistivity. (See column 5, lines 30-33, 37-38).

Accordingly, Emanuelson does not teach or suggest each and every element of the claimed invention. Withdrawal of the § 102 rejection based on Emanuelson is respectfully requested.

Balko is also applied in view of De Haas or, alternatively De Haas is applied in view of Balko to reject claims 3-5, 10-11, 13-15 and 17-23 under 35 U.S.C. § 103(a). De Haas does not make up for the shortcomings of Balko as set forth above. Similarly, Balko does not make up for the shortcomings of De Haas as set forth above. Additionally, neither De Haas nor Balko teach or suggest a fluid flow pattern to distribute fuel and oxidant across the plate material as claimed. Neither Balko nor De Haas suggests any motivation to modify the teachings of Balko or De Haas in order to provide the claimed invention. Accordingly, Balko in combination with De Haas or, alternatively De Haas in combination with Balko do not render the claimed invention obvious within the meaning of 35 U.S.C. § 103(a). Withdrawal of the § 103 rejections are respectfully requested.

Emanuelson is applied in view of De Haas or, alternatively De Haas is applied in view of Emanuelson to

reject claims 3-5, 10-11, 13-15 and 17-23 under 35 U.S.C. § 103(a). De Haas does not make up for the shortcomings of Emanuelson as set forth above. Similarly, Emanuelson does not make up for the shortcomings of De Haas as set forth above. Specifically, neither De Haas nor Emanuelson teach or suggest plate material of electrically conductive material as claimed. Rather, De Haas discloses plates made of electrically insulating material while Emanuelson discloses plates having electrical thru-plane resistivity and in-plane resistivity. Also, neither De Haas nor Emanuelson teach or suggest plate material which is impermeable to hydrogen and oxygen as the claimed plate material.

Neither De Haas nor Emanuelson suggest any motivation to modify the teachings of Emanuelson or De Haas in order to provide the claimed invention. Accordingly, Emanuelson in combination with De Haas or, alternatively De Haas in combination with Emanuelson do not render the claimed invention obvious within the meaning of 35 U.S.C. § 103(a). Withdrawal of the § 103 rejections are respectfully requested.

De Haas is applied in view of Balko or, alternatively Balko is applied in view of De Haas as previously applied, or Emanuelson is applied in view of De

Haas or, alternatively De Haas is applied in view of Emanuelson as previously applied, and further in view of Tolles in order to reject dependent claim 12 under 35 U.S.C. § 103(a). Neither the combination of Balko and De Haas nor the combination of Emanuelson and De Haas teach or suggest the claimed invention as set forth above. Tolles does not make up for the shortcomings of Balko and De Haas or Emanuelson and De Haas as set forth above.

Specifically, Tolles is directed to a mechanical polishing system with no disclosure of applicability to flow field plates. Accordingly, Tolles does not teach or suggest a plate material of electrically conductive material and impermeable to hydrogen and oxygen as claimed.

Additionally, Tolles does not teach or suggest blasting methods as claimed or a fluid flow pattern which distributes fuel and oxidant across a plate material as claimed.

Neither De Haas nor Balko suggest any motivation to modify the teachings of Balko, De Haas or Tolles in order to provide the claimed invention. Similarly, neither Emanuelson nor De Haas suggest any motivation to modify the teachings of De Haas, Emanuelson or Tolles in order to provide the claimed invention. Accordingly, neither the combination of De Haas, Balko and Tolles nor the combination of De Haas, Emanuelson and Tolles renders the claimed

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invention obvious within the meaning of 35 U.S.C. § 103(a).
Withdrawal of the § 103 rejections are respectfully
requested.

De Haas is applied in view of Balko or,
alternatively Balko is applied in view of De Haas as
previously applied, or Emanuelson is applied in view of De
Haas or, alternatively De Haas is applied in view of
Emanuelson as previously applied, and further in view of
Kondrats to reject dependent claim 16 under 35 U.S.C. §
103(a). Neither the combination of De Haas and Balko nor
the combination of Emanuelson and De Haas teach or suggest
the claimed invention as set forth above. Kondrats does not
make up for the shortcomings of the combination of De Haas
and Balko or Emanuelson and De Haas as set forth above.

Specifically, Kondrats is directed to vinyl
polymer masks used as protective coatings during mechanical
processing operations of vehicles or buildings. Kondrats
does not teach or suggest a plate material of electrically
conductive material and impermeable to hydrogen and oxygen
as claimed. Additionally, Kondrats does not teach or
suggest blasting methods as claimed or a fluid flow pattern
which distributes fuel and oxidant across a plate material
as claimed.

Neither De Haas nor Balko suggest any motivation

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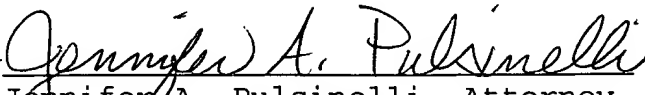
to modify the teachings of De Haas, Balko or Kondrats in order to provide the claimed invention. Neither De Haas nor Emanuelson suggest any motivation to modify the teachings of De Haas, Emanuelson or Kondrats in order to provide the claimed invention. Accordingly, neither the combination of De Haas, Balko and Kondrats nor the combination of De Haas, Emanuelson and Kondrats renders the claimed invention obvious within the meaning of 35 U.S.C. § 103(a). Withdrawal of the § 103 rejections are respectfully requested.

Therefore, withdrawal of the § 102 rejections and the § 103 rejections based on the applied combinations of primary and secondary references are respectfully requested.

Reconsideration and allowance of the claims is respectfully requested.

Respectfully submitted,

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